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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,335	01/11/2002	Glenn W. Skala	8540G-000004	7995

27572 7590 08/27/2003

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EXAMINER
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KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 08/27/2003

3.

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/044,335

Applicant(s)

SKALA ET AL.

Examiner

Stephen J. Kalafut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20,25,30 and 35-54 is/are allowed.
- 6) ☒ Claim(s) 1-8,11,21-24,26-29 and 31-34 is/are rejected.
- 7) ☒ Claim(s) 9,10 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Claims 11, 21-24, 26-29 and 31-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent for "said control valve" in claim 11. If the intended antecedent is the "valve" in claim 1, the word "control" should be deleted. Claims 21-24, 26-29 and 31-34 are drawn to a "control system", but depend from claims drawn to a "fuel processing system".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Sasaki (US 4,642,273).

Sasaki discloses a fuel cell including a fuel processing system, in which the fuel processing system includes a fuel processor (1), which is a reformer. The reformer produces hydrogen reformat from natural gas (column 1, lines 31-33), and feeds this reformat into a fuel cell (4) via an outlet line which includes a valve (7c). The system also includes a metering valve (7a) for the raw fuel and a metering valve (7b) for water in the form of steam, which provide fluid communication for these two reactants into the reformer, which would thus be a steam

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reforming reactor. Since the output valve may have its position varied (column 3, lines 54-55), and thus is at times partially closed, the reformer would act as a storage buffer. The system also includes a controller (15) which modulates the reformer output valve (7c).

Claims 1 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kato *et al.* (US 6,569,552).

Kato *et al.* disclose a fuel cell including a fuel processing system (100), in which the fuel processing system includes a fuel processor (120), which is a reformer (column 2, line 66 through column 3, line 8). Hydrogen from the reformer is then fed to a fuel cell stack (200) via a line (505a) connected to the fuel processor outlet and including a valve (505). The system also includes a metering pump (131) for the raw fuel. Since the output valve may be opened and closed, and thus its position varied (column 3, lines 50-52), the reformer would act as a storage buffer. The system also includes a controller (600, figure 3) which opens and closes the valve in response to a signal from a hydrogen concentration sensor (601).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Acker (US 6,322,917).

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Sasaki does not disclose the various types of reformers, or a water gas shift reactor, within the fuel processing system. Acker discloses a water gas shift reactor (40) within a fuel processing system, which receives the output of a reformer (30). Acker also teach the known varieties of reformer, including steam reformer, partial oxidation and autothermal reforming (column 3, lines 7-9). Steam reforming is endothermic, while partial oxidation is exothermic. Autothermal reforming is a combination of the two others, in which the heat produced by partial oxidation is absorbed by steam reforming. For these thermal considerations, it would be obvious to the ordinary artisan to select an appropriate reforming arrangement as taught by Acker, for the fuel cell system of Sasaki.

Claims 13-20, 25, 30 and 35-54 are allowed. The prior art applied above, or cited either below or by applicants, does not disclose a control system for a fuel processor, which includes fuel and water metering devices, along with a controller which is responsive to a rate of air flow into the fuel processor, the voltage of the fuel cell stack or a variation thereof, the pressure differential signal across a valve along the fuel line, or the flow rate of the fuel through this line and valve.

Claims 21-24, 26-29 and 31-34 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. These claims depend from allowable claims 20, 25 and 30.

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Claims 9, 10 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims also recite the controller being responsive to a rate of air flow into the fuel processor or the pressure differential across a fuel line valve.

Claim 11 is would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. This claim recites the controller being responsive to the voltage of the fuel cell stack or a variation thereof.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Maston *et al.* (US 6,051,192) and Takeda *et al.* (US 6,586,125) disclose fuel cell systems with fuel processors and controllers. Ruoff *et al.* (6,593,018) disclose a device for injecting air, fuel and water vapor into a reformer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 703-308-0433. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 703-308-2383. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

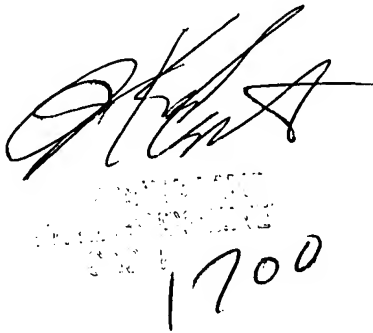
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

sjk

A handwritten signature in cursive script, possibly reading "J. K. A.", is written over a circular official stamp. Below the stamp, the number "1700" is handwritten.